

Source of Power in the Voltaic Pile 233

recent times., rank such men as Pfaff, Marianini, Fechner, Zamboni, Matteucci, Karsten, Bouchardat, and as to the excitement of the power, even Davy; all bright stars in the exalted regions of science. The theory of chemical action was first advanced by Fabroni,¹ Wollaston,² and Parrot,³ and has been more or less developed since by CErsted, Becquerel, De la Rive, Ritchie, Pouillet, Schenbein, and many others, amongst whom Becquerel ought to be distinguished as having contributed, from the first, a continually increasing mass of the strongest experimental evidence in proof that chemical action always evolves electricity;⁴ and De la Rive should be named as most clear and constant in his views, and most zealous in his production of facts and arguments, from the year 1827 to the present time.

786. Examining this question by the results of definite electro-chemical action, I felt constrained to take part with those who believed the origin of voltaic power to consist in chemical action alone (610, 700), and ventured a paper on it in April, 1834⁶ (610, etc.), which obtained the especial notice of Marianini.⁷ The rank of this philosopher, the observation of Fechner,⁸ and the consciousness that over the greater part of Italy and Germany the contact theory still prevailed, have induced me to re-examine the question most carefully. I wished not merely to escape from error, but was anxious to convince myself of the truth of the contact theory; for it was evident that if contact electromotive force had any existence, it must be a power not merely unlike every other natural power as to the phenomena it could produce, but also in the far higher points of limitation, definite force, and finite production (1053).

787. I venture to hope that the experimental results and arguments which have been thus gathered may be useful to science. I fear the detail will be tedious, but that is a necessary consequence of the state of the subject. The contact

¹ A.D. 1792, 1799. Becquerel's *Traite de VElectricite*, i. pp. 81-91, and Nicholson's *Quarto Journal*, iii. 308, iv. 120, or *Journal de Physique*, vi. 348.

² A.D. 1801. *Philosophical Transactions*, 1801, p. 427.

³ A.D. 1801. *Annales de Chimie*, 1829, 2^e i- 45 > 1^e 3^e, xlv. 361.

⁴ A.D. 1824, etc. *Annales de Chimie*, 1824, xxv. 405; 1827, xxxv. 113;

1831, xlv. 265, 276, 337; xlvii. 113; xlix. 131.
⁵ *Ibid.* 1828, xxxvii. 225; xxxix. 297; 1836, lxii. 147:
or *Memoires de*
Geneve, 1829, iv. 285; 1832, vi. 149; 1835, vii.
⁶ *Philosophical Transactions*, 1834, p. 425.
⁷ *Memorie della Societa Italiana in Modena*, 1837, xxi. p.
205.
⁸ *Philosophical Magazine*, 1838, xiii. 205; or Poggendorf's
Annalen, xlii.
p. 481. Fechner refers also to Pfaff's reply to my paper.
I never cease to
regret that the German is a sealed language to me.